

Challenge Rules

Overview

The objective of the Nano-Satellite Launch Challenge is to bring forth innovations in propulsion and other technologies, as well as operations and management relevant to safe, low-cost, small payload delivery systems for frequent access to Earth orbit. The *Space Florida Small Satellite Research Center* (SFSSRC) and the National Aeronautics and Space Administration (NASA) share the view that these technologies will be beneficial to broader applications in future launch systems and commercial capability for dedicated launches of small satellites at a cost comparable to secondary payload launches—an emerging market for Government, commercial, and academic customers.

This is a first-to-achieve Challenge with a prize purse of \$ 1.5 million going to the first Team that accomplishes the task of launching a Nano-Satellite with a mass of at least one kilogram into Earth orbit, twice within seven consecutive days. Secondary prizes of \$1 million and \$500,000 will go to the next two Teams that subsequently achieve this requirement as defined in these rules. This document details the rules for participating in, and winning the Challenge.

Rules

The final interpretation of all rules is at the sole discretion of the judges and SFSSRC. All activities undertaken by competitors in connection with this Challenge shall be done in full compliance with all applicable local, state, and federal laws and regulations.

R-1.0 Nano-Satellites

- 1.1 For the purposes of this Challenge, a “Nano-Satellite” is defined as a free-flying payload separate from the launch vehicle, weighing no less than one kilogram and no more than 10 kilograms. The final or upper stage of the launch vehicle is not considered the payload or Nano-Satellite. The Challenge judges reserve the right to examine the Nano-Satellites prior to launch to ensure compliance.
- 1.2 The Nano-Satellites are not required to accomplish designed functions to win the Challenge. If any satellite does not operate as planned, this will not constitute a failure for the Team, as long as the one-orbit requirement is met.
- 1.3 To win the Challenge, a Team’s Nano-Satellites (at least one per successful Challenge Launch Attempt within seven consecutive days) must each achieve at least one full, verifiable orbit of the Earth from the point of release from the Launch Vehicle. Any orbital inclination will be acceptable in Low Earth Orbit, as long as it is the intended orbit for the Challenge Launch Attempt. The maximum orbital perigee shall be 2000 kilometers.
- 1.4 The Nano-Satellites may be provided by the Team or any customer or partner of the Team. There is no prohibition on launching Nano-Satellites provided by government agencies or international entities so long as it is done in compliance with all applicable local, state, and federal laws and regulations.
- 1.5 The Nano-Satellites must be reviewed by the FAA’s Office of Commercial Space Transportation (AST) to ensure compliance with federal regulations. A letter of compliance

or exemption from AST must be provided to SFSSRC prior to officially scheduling any Challenge Launch Attempt.

R-2.0 Launch Vehicles

- 2.1 For the purposes of this Challenge, a “Launch Vehicle” is a vehicle dedicated to deploying Nano-Satellites into Earth orbit as its primary payloads. The Launch Vehicle must be a distinct combination of core propulsive stages and hardware used to deliver a stand-alone payload to earth orbit. Launch Vehicles may be expendable or reusable. They may be launched from the ground, water, carrier aircraft, balloon systems, or suborbital spacecraft.
- 2.2 Launch Vehicles may be based on designs developed by or for the U.S. Government or any foreign government, but must not be manufactured with substantial investment from the U.S. Government or any foreign government. “Substantial investment” shall be defined as more than initial phase one SBIR funding or \$150,000 whichever is greater. This does not apply to any aircraft or other conveyance used to air-launch the Launch Vehicles. Teams using Launch Vehicles based on U.S. Government or foreign government designs must certify to SFSSRC that these designs are available to all other competitors, and their vehicles will be available for commercial launch operations after the Challenge.
- 2.3 The Launch Vehicle used for a Team’s second successful Nano-Satellite deployment must be the same type/design as the one used for their first successful deployment. The Challenge judges may be called upon to determine if a Team’s Launch Vehicle is different from one Challenge Launch Attempt to the next.

R-3.0 The Challenge

- 3.1 A “Challenge Launch Attempt” is an official attempt to launch a Nano-Satellite into orbit for the purpose of winning the Challenge. Two successful Challenge Launch Attempts are required to win the Challenge, and both must be registered and coordinated with the SFSSRC. Unregistered launches may be conducted by any Team, but only registered Challenge Launch Attempts count toward winning the Challenge.
- 3.2 SFSSRC will maintain a master schedule for Challenge Launch Attempts, on a first-to-schedule basis. SFSSRC may limit some schedule opportunities, based on the availability of judges, to allow travel, or to avoid other conflicts with other Challenge Launch Attempts on the schedule.
- 3.3 When a Team schedules its Challenge Launch Attempts, SFSSRC will assign a Window of Opportunity of no more than two weeks (less, if requested by the Team) to conduct the two necessary launches within seven consecutive days.
- 3.4 Teams may reserve only one scheduled Window of Opportunity at a time for their Challenge Launch Attempts. To accommodate weather or technical contingencies, at the request of a Team Leader, SFSSRC may shift a Team’s assigned two-week Window of Opportunity by up to one week before or after (but contiguous to) the original scheduled Window of Opportunity. SFSSRC will allow only one shift of this nature for each Team’s Window of Opportunity. These shifts may not be possible if another Team’s Window of Opportunity would be encroached at the same launch site, or if other Challenge or non-Challenge activities preclude the schedule shift availability. If additional Windows of Opportunity are required by any Team, the earliest they may be scheduled is four weeks from the close of their prior opportunity.

- 3.5 For any Team's scheduled Window of Opportunity, that Team's Challenge Launch Attempts must be conducted or staged from the same location.
- 3.6 Teams may conduct as many Challenge Launch Attempts as are necessary to win the Challenge, and may include more than two Challenge Launch Attempts within a single Window or Opportunity.
- 3.7 Two Challenge judges must be present for every Challenge Launch Attempt, and SFSSRC must give prior approval to proceed with the launch. The Challenge judges reserve the right to examine the Challenge Nano-Satellite(s) prior to launch to ensure compliance with weight and dimensional requirements.
- 3.8 Challenge Launch Attempts may occur from any site in the United States. In the case of air launches, the carrier vehicles must take off from U.S. soil. In the case of offshore (ocean platform) launches, the vehicles must be processed on U.S. soil and be launched from U.S. territorial waters.
- 3.9 Each Challenge Launch Attempt must receive applicable regulatory approvals from Federal Aviation Agency (FAA) Office of Commercial Space Transportation (CST) and any other applicable authorities (such as the US Air Force or NASA if launched from their installations, and/or any state-level regulatory body) to ensure safety compliance. Proof of compliance with all applicable regulations must be provided to the SFSSRC prior to officially scheduling a Window of Opportunity for a Challenge Launch Attempt.
- 3.10 Teams must comply with all U.S. laws, regulations and policies, including those relating to export control and nonproliferation, and the laws of relevant state and local jurisdictions that pertain to or govern any activities conducted by the Teams in connection with the Challenge. This includes compliance with the National Environmental Policy Act and regulations set by the Occupational Safety and Health Administration.
- 3.11 Teams may use U.S. Government facilities, personnel, hardware, or information previously developed by the U.S. Government if access is available on an equitable basis to other Teams. Teams intending to use such U.S. Government assets must inform the SFSSRC in advance of such use, to allow the SFSSRC to determine if access is available on an equitable basis. Teams using any U.S. Government facilities must agree in writing with the facility management to comply with all facility security, safety, health, and worker protection rules prior to accessing the facility
- 3.12 Teams must be able to verify that their Nano-Satellites have successfully completed at least one orbit, via ground tracking or other means. This might be done through partnerships with NASA, the U.S. Air Force, or other entities. An acceptable system of verification must be coordinated by each Team with SFSSRC and approved by the judges prior to scheduling a Launch Window of Opportunity.
- 3.13 All launches shall comply with the U.S. Government Orbital Debris Standards Mitigation Practices (<http://orbitaldebris.jsc.nasa.gov/library/USGODStandardPractices.pdf>) and shall provide documentation of compliance to the launch site 30 days prior to the first launch attempt.
- 3.14 Should any launched item exceed 250km in perigee, the Team shall coordinate with the launch site/range to have a Collision on Launch Assessment (COLA) performed and approved per the launch site requirements. The COLA is done to ensure the spacecraft maintains a safe distance from the International Space Station.
- 3.15 There should be no radioactive materials used in the launch vehicle or spacecraft(s). A written statement that no radioactive materials are being used shall be provided to the launch site operator 30 days prior to the arrival of the radioactive materials.

R-4.0 Teams and Investment

- 4.1 Each Team must register with SFSSRC to be eligible to compete in the Challenge. SFSSRC will provide written approval of the application to formalize the Team's acceptance into the Challenge.
- 4.2 A Team is an individual or private entity, or a group of individual or private entities, that register to participate in the Challenge. A Team is comprised of a Team Leader and Team Members. The Team Leader is the sole agent representing the team regarding participation in the Challenge. In the case of a Team Leader that is a private entity, it must appoint an individual to serve as the Team Leader.
- 4.3 The Team Leader shall be the primary point of contact with SFSSRC and shall have the authority to bind the Team and all Team Members in all matters relating to the Challenge and the relationship between the Team and the SFSSRC.
- 4.4 Teams must notify SFSSRC promptly of any proposed change in their Team Leader designation. Proposed Team Leader changes are subject to approval by the SFSSRC.
- 4.5 Each registered competing Team must enter into a Team Agreement with SFSSRC. This team agreement will define such issues as intellectual property rights, media and merchandising rights, and use of logos, etc. Execution of the Team Agreement indicates the willingness and intent of a registered competitor, Team Leader of a registered competitor, and all of the registered competitor's team members to participate in the Challenge to comply with Challenge rules and the terms of the Team Agreement.
- 4.6 All Team Members shall apply to register for the Challenge through the Team Leader and will be considered registered competitors in the Challenge. All team members must execute an "adoption of agreement" committing to all terms of the Team Agreement.
- 4.7 Current employees, contractors, or consultants of SFSSRC or any affiliate organization, including Space Florida, may not serve as members of any Team.
- 4.8 Team Members may not be Federal employees acting within the scope of their employment at any U.S. Government agency or organization principally or substantially funded by the Federal Government, including Federally Funded Research and Development Centers, Government-owned, contractor operated (GOCO) facilities, and the University Affiliated Research Centers.
- 4.9 Anyone can enter the Challenge, but only U.S. citizens, businesses, or permanent residents can win the prize purses. To be eligible to win a Challenge prize, an individual or entity, a) in the case of a private entity, shall be incorporated in and maintain a primary place of business in the United States, and b) in the case of an individual, whether participating individually or as a member of a group, shall be a citizen or permanent resident of the United States. Additional details are provided in the Team Agreement.
- 4.10 Teams may be disqualified, at the sole discretion of SFSSRC for unsportsmanlike conduct, including, but not limited to, the use of profanity, derision of others, and public release of misleading or inaccurate information about the Challenge.
- 4.11 Teams may be sponsored by corporations or other organizations that are not part of the U.S. Government or any foreign government.
- 4.12 Teams may not accept state, federal or foreign government funding for purposes of participation in the Challenge. NASA Space Grant Consortiums and university students are exempt from this prohibition so long as their funding is not directly tied to participation in the Challenge.

R-5.0 Technical and Logistical Assistance

- 5.1 Any Team may accept non-cash technical, permitting, and logistical assistance from a state or municipally empowered spaceport authority or FAA-licensed Spaceport Operator with responsibility at the site where a Team intends to conduct a Challenge Launch Attempt. Such assistance may include no-cost access to facilities, equipment and infrastructure. However, assistance from a spaceport authority or FAA-licensed Spaceport Operator related to hands-on support for Nano-Satellite processing, Launch Vehicle integration, or launch operations is prohibited.
- 5.2 Any Team deciding to accept such assistance from a spaceport authority or FAA-licensed Spaceport Operator must advise SFSSRC. SFSSRC or judges must determine that such assistance will be similarly available to other Teams using that authority's spaceport.
- 5.3 Teams may not accept technical or logistical assistance from U.S. Government agencies, beyond those services normally required or provided in support of a launch operation and to protect government property and ensure safety. If a Team is launching a Nano-Satellite on behalf of a U.S. Government or foreign government customer, that customer may only provide technical assistance related to the integration of the Nano-Satellite onto the Launch Vehicle.
- 5.4 All Teams are responsible for range safety costs and compliance with range safety procedures. All Teams are responsible for obtaining the necessary permits and licenses from the Federal Aviation Agency (FAA) and Federal Communications Commission (FCC).

R-6.0 Challenge Deadlines and Registration

- 6.1 Team registration will begin on July 1, 2012 and continue until November 1, 2014. Registration materials and instructions will be available on the SFSSRC website. Teams must register at least 30 days before their first desired Challenge Launch Attempt. This will allow SFSSRC sufficient time to process their registration materials and assign one or more judges to review the Team's plans, operations, and Launch Vehicle to ensure compliance with the Challenge rules. Teams may pursue any regulatory approvals or engage with other necessary authorities or agencies prior to registering for the Challenge.
- 6.2 The registration fee for each team is \$10,000 until December 1, 2012. After December 1, 2012, the registration fee for each team is \$20,000. Registrants will be required to include information on the proposed launch site, a description of the flight safety system, proof of insurance, and copies of any issued permits or licenses or pending Challenge related applications for permits and licenses issued by the Federal Aviation Agency (FAA) and Federal Communications Commission (FCC) in their registration materials. Registrants will be required to pay a scheduling fee of \$15,000 for each launch Window of Opportunity assigned.
- 6.3 If FAA and FCC licenses and permits and applications are not available at the time of registration, they must be submitted to SFSSRC at least 30 days before the first desired Challenger Launch Attempt. Failure to submit this information to SFSSRC will result in forfeiture or non-assignment of a Window of Opportunity.
- 6.4 The deadline for Teams to win the Challenge is December 31, 2014. If no Team is able to win the Challenge by that date, the Challenge will be declared "expired".
- 6.5 The final date for scheduling a Challenge Launch Attempt with SFSSRC is December 1, 2014.

R-7.0 Prize Purse and Bonus Prizes

- 7.1 Three prizes are planned for the Nano-Satellite Launch Challenge.

- 7.1.1 A Challenge prize of \$ 1.5 million will be provided by NASA to the first Team that accomplishes the task of launching a Nano-Satellite into Earth orbit twice within seven consecutive days in compliance with the Challenge rules.
- 7.1.2 A second Challenge prize of \$1 million will be provided by NASA to the next Team that accomplishes the task of launching a Nano-Satellite into orbit twice within seven consecutive days by a different launch system (for example, air launch versus ground launch) in compliance with the Challenge rules.
- 7.1.3 A Challenge prize of \$500,000 will be provided by NASA to the second Team that accomplishes the task of launching a Nano-Satellite into Earth orbit twice within seven consecutive days using either launch system in compliance with the Challenge rules.
- 7.2 The SFSSRC, in cooperation with other Challenge sponsors, may offer Bonus Prizes to incentivize additional activities associated with the Challenge objectives. Initial Bonus Prizes are listed below. Other Bonus Prizes may be added before the Challenge is expired.
 - 7.2.1 Space Florida will provide an additional \$_____ cash prize to a Team that wins the Challenge by staging both of its winning Challenge Launch Attempts from Florida. This includes the use of Cape Canaveral Spaceport or the Cecil Field Spaceport as a launch base for expendable or reusable Launch Vehicles, or as an integration site for Launch Vehicles carried aloft for air-launch.
- 7.3 NASA will issue the Challenge prize payment to the winning Team's Team Leader.
- 7.4 Bonus Prizes will be issued separately from the main Challenge Prize by Challenge sponsors responsible for providing the Bonus Prize. SFSSRC will not be responsible for a Challenge sponsor's failure to deliver the Bonus Prize.
- 7.5 An official Challenge Website will include a list of all Challenge sponsors.

R-8.0 Disqualification

- 8.1 A Team may be disqualified from the Challenge for rules violation at any time prior to, during, or after a Challenge Launch Attempt at the discretion of the Challenge judges.
- 8.2 SFSSRC or a Challenge judge will notify a Team of a suspected rules violation prior to any official disqualification, allowing the Team to appeal the pending disqualification to a panel that will consist of five Challenge judges with ten days of notification. The decision of the panel of judges is final.
- 8.3 During an appeal, any of the Team's reserved dates for Challenge Launch Attempts will be maintained. After disqualification, the scheduled dates will be re-opened for other Teams.
- 8.4 Disqualified Teams will not be allowed to participate in the Challenge or win any prize money.
- 8.5 In lieu of Team disqualification for certain rules violations (such as unsportsmanlike conduct) SFSSRC may require the removal one or more individual Team Members from a Team.

R-9.0 Liability

- 9.1 Each Team must provide the SFSSRC with proof of liability insurance coverage, consistent with the requirements set by the FAA and any other government authority for each Challenge Launch Attempt.
- 9.2 Each Team's liability insurance must also provide up to \$1 million in coverage for their operations leading up to, and following, any Challenge Launch Attempt.
- 9.3 Each Team must sign a hold-harmless agreement that dismisses any responsibility of SFSSRC, Challenge judges, FUNDERS, and the U.S. Government and its related entities for any liability

associated with the Team's pursuit of the Challenge prize purse. There will be no "indemnification" of any sort granted by the U.S. Government or SFSSRC.

- 9.4 Each Team Member shall indemnify the SFSSRC for any claims arising from the acts or omissions of his/her Team or the Team's sponsoring organizations.
- 9.5 By competing in the Challenge, each Team agrees to assume any and all risks and waive claims, whether in contract or tort, against SFSSRC and its contractors and related entities, including judges, Funders, and the U.S. Government and its related entities, for any injury, death, damage, loss of property or revenue or profits, whether direct, indirect, or consequential, arising from its participation in a competition, whether such injury, death, damage or loss arises through negligence or otherwise, except in the case of willful misconduct.
- 9.6 Each Team acknowledges that SFSSRC has entered into agreements with the FUNDERS to pay the purse and agrees that the obligation for payment of the purse to declared winners belongs to FUNDERS and not to SFSSRC.
- 9.7 All competitors will be responsible for compliance with applicable mishap investigation and reporting protocols.

R-10.0 Judges and Judging

- 10.1 SFSSRC will recruit a panel of judges with relevant launch industry experience to support the Challenge, including the interpretation of rules, disqualification of Teams that violate the rules, the appeals process for Teams that might appeal a disqualification, or the mediation of any rules-related issues raised by any Teams.
- 10.2 Judges may not have personal or financial interests in, or be an employee, officer, director, or agent of any entity that is a registered Team in the Challenge. Judges may not have a familial or financial relationship with an individual who is a registered Team member in the Challenge. SFSSRC, its employees, officers, directors, and agents, and the immediate family of such employees, officers, directors and agents, are not eligible to be judges or participants in the Challenge.
- 10.2 Non- NASA employee judges will operate under Non-Disclosure Agreements designed to protect any Intellectual Property of the competing Teams. Non-disclosure agreements with NASA employees are not need to protect company proprietary or confidential business information. NASA employees are subject to the Trade Secrets Act (18 U.S.C. 1905)
- 10.3 The judges will not be permitted to provide technical assistance to any Team.
- 10.4 At least one judge must be present during the pre-launch integration of Nano-Satellites to their respective Launch Vehicles, and during any Challenge Launch Attempt.
- 10.5 SFSSRC will assign judges to ensure rules compliance for each Team during their Challenge Launch Attempts, and Teams are required to provide unfettered access to these judges during these periods.
- 10.6 The judges shall also be provided access to any other Team information they deem necessary to ensure rules compliance.

#